

WHAT IS CLAIMED IS:

- 1 1. An interference-aided signal acquisition and tracking system comprising:
2 a vehicle having at least two receivers configured to detect external
3 signals, the at least two receivers having an output dependent on attitude of the vehicle;
4 an interference detector that measures the output of at least one of the at
5 least two receivers;
6 a noise canceller that combines the output of the at least two receivers; and
7 a signal processor that extracts a desired signal from the output of the
8 noise canceller, wherein the output of the interference detector is used to control the noise
9 canceller as to reject unwanted signals and enhance performance of the signal processor
10 in extracting the desired signal.
- 1 2. The system of claim 1, wherein the vehicle is a missile.
- 1 3. The system of claim 1, wherein the interference detector comprises a
2 rotation tracker that provides a rotation estimate.
- 1 4. The system of claim 3, wherein the noise canceller comprises an
2 interference cancellation controller that applies modulations to null an interference signal
3 as a function of the rotation estimate.
- 1 5. The system of claim 1, further comprising phase modulators.
- 1 6. The system of claim 1, wherein the interference detector comprises an
2 analog intensity detector.
- 1 7. The system of claim 1, wherein the interference detector and noise
2 canceller are embodied in programmed instructions in a rotation preprocessor.
- 1 8. The system of claim 1, wherein the noise canceller modulates to null
2 interference in the detected external signals.

1 9. A method of signal acquisition and tracking comprising:
2 receiving external signals at a spinning vehicle;
3 measuring the received external signals;
4 modulating the received external signals to null an interference signal; and
5 extracting a desired signal from the combined external signals.

1 10. The method of claim 9, further comprising providing a rotation estimate of
2 the rotation of the spinning vehicle.

1 11. The method of claim 9, wherein modulating the received signals to null an
2 interference signal comprises combining the measured external signals and rejecting
3 unwanted signals.

1 12. The method of claim 9, further comprising correcting phase of an output
2 signal from the modulation for rotation effects.

1 13. The method of claim 9, wherein modulating the received external signals
2 is performed on a pre-satellite basis using satellite geometry information.

1 14. A signal acquisition and tracking system where interference is cancelled
2 for jamming immunity with spinning vehicles operating in interference environments, the
3 system comprising:
4 a number of signal receivers associated with a spinning vehicle;
5 a rotation tracker that obtains signals from the number of signal receivers
6 and provides a rotation estimate;
7 a global positioning system (GPS) processor that provides satellite
8 geometry information; and
9 an interference cancellation controller that obtains the rotation estimate
10 and the satellite geometry information and modulates to null interference received by the
11 number of signal receivers.

1 15. The system of claim 14, wherein the signal receivers are antennas on a
2 missile.

1 16. The system of claim 14, wherein the modulation done by the interference
2 cancellation controller is done on a per-region-of-sky basis.

1 17. The system of claim 14, wherein the modulation done by the interference
2 cancellation controller is done on a per-satellite basis.

1 18. The system of claim 14, wherein the interference cancellation controller
2 corrects the phase of the signals from the number of signal receivers for rotation effects.

1 19. The system of claim 14, wherein the interference cancellation controller
2 predetermines modulation commands as functions of roll and pitch angles.

1 20. The system of claim 14, wherein the rotation tracker and interference
2 cancellation controller are implemented by an application specific integrated circuit
3 (ASIC).